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STUDY OF FACIAL INDEX AMONG KURDISH POPULATION

ANWAR AHMAD AMIN, ZHWAN JAMAL RASHID & ARASS JALAL NOORI

Department of Pedodontics, Orthodontics, and Preventive Dentistry (P.O.P), School of Dentistry/ Faculty of Medical Sciences University of Sulaimani, Kurdistan Region, Iraq

ABSTRACT

Background: Assessment of facial types have always been of great interest because they are used in forensic medicine, plastic surgery, Orofacial surgery, pediatrics, dentistry, and for diagnostic comparisons between patients and normal populations This study was conducted in order to evaluate the facial type of Kurdish population in Sulaimani City, Kurdistan region-Iraq by using facial index.

Methodology: The present study was conducted in the school of Dentistry, University of Sulaimani on 200 adults comprising of 105 females and 95 males aged 18-24 years. The measured parameters were morphological facial height and breadth. The standard spreading caliper with scale was used for the measurement of facial parameters.

Results: The mean morphological facial height for both genders was 105.255 ± 8.9 and mean morphological facial width was 116.8±8.7. The mean facial index was 90.6 ±9.65 for both genders. The dominant facial phenotype was leptoprosopic (50.5%) followed by mesoprosopic (19%),hypereuryprosopic (15.5%),euryprosopic (13.5%) and hyperleptoprosopic (1.5%) in both genders.

Conclusions: The dominant facial type in the Kurdish population of Sulaimani is leptoprosopic in both genders, however in males mesoprosopic and euryprosopic types were more common than in females and in females leptoprosopic and hypereuryprosopic were more common than in males.

KEYWORDS: Anthropometry, Facial Height, Facial Width, Facial Index, Kurdish Population

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Original Article

INTRODUCTION

Anthropometry is the measurement of living subjects(Ngeow W C, 2009).Anthropological facial analysis is useful in identification of racial, ethnical, and sexual differences(Tahamida Yesmin, 2014). Anthropologists are interested in studying intra- and inter-population variations among different morphological characters (Malik, 2007).

Evaluation of facial type is very important for the planning and prognosis of orthodontic treatment. Furthermore, direction of growth of the craniofacial complex is indicated by the facial pattern and must be taken into account when selecting the orthodontic biomechanics (Fernanda Catharino Menezes Franco, 2013).

Types of face, as determined by craniofacial measurements, are divided into five international anatomical categories: hypereuryprosopic, euryprosopic, mesoprosopic, leptoprosopic and hyperleptoprosopic (D. JEREMIĆ, 2013)

This study was conducted in order to evaluate the facial type of Kurdish population in Sulaimani City, Kurdistan region-Iraq by using facial index to establish a baseline quantitative data.

MATERIALS AND METHODS

This study was conducted on a sample of 200 dental students (105 females and 95 males), aged 18-24 years from Sulaimani city that were randomly selected. Measurements were performed at the School of Dentistry, Faculty of Medical Sciences in the University of Sulaimani. The data was collected between January and April 2015. All subjects were without past and existing craniofacial trauma, deformities, facial scars or plastic surgery. The measurement process was explained to each subject and permission was obtained from each tested person before measurement.

The subjects were placed in a sitting position, relaxed, with the head in the correct anatomical position (natural head position) and the mandible in the maximum intercuspal position and the mouth closed. A standard spreading caliper with scale was used for measurement of linear distances between landmark points. Scale reads up to 35 cm. All measurements were performed in the same way and under the same conditions.

Landmark points used in measuring the parameters are:

N-Nasion: The midpoint of the nasofrontal suture;

Gn-Gnathion: in the midline, the lowest point on the lower border of the chin;

zy-zygomatic Prominences, zygion: the most lateral point on the zygomatic arch.

The facial index is the ratio of height of the face and width of the upper face and was calculated according to the formula:

$$\text{Facial index} = \frac{\text{Height of face}}{\text{Width of upper face}} * 100 \quad = \frac{\text{Na–Gn}}{\text{zy–zy}} * 100$$

The facial index was used to develop five facial types: Hyperleptoprosopic, leptoprosopic, mesoprosopic, euryprosopic and hypereuryprosopic. Facial types were categorized according to Banister's classification as shown in Table 1.

Statistical analysis were done by descriptive statistics and Student's (independent) t-test. Statistical significance is set at 5%.

Table 1: Banister's Classification of Facial Types

Face Shape	Range of Prosopic Index
(1) Hypereuryprosopic (very broad face)	<79.
(2) Euryprosopic (broad face)	80–84.9
(3)Mesoprosopic (round face)	85–89.9
(4) Leptoprosopic (long face)	90–94.**9**
(5) Hyperleptoprosopic (very long face)	>95

RESULTS

The study provides important new information concerning the total facial index and face shape in the Kurdish population.

The finding of this study are depicted in Tables 2, 3, and figure 1. The mean values of facial height, facial width and facial index were respectively 109.4± 8.35, 120.01±.9.06, 91.05 ± 9.54 in males and 101.5±8.35, 112.01±9.06, 90.05 ± 9.7 in females (Table 2). The results of this study revealed a higher values of facial height, facial width and facial index in males compared to females.

Table 2: Mean and SD of Facial Height, Facial width and Facial Index of Kurdish Males and Females

	Mean			SD			
	Male	**Female**	**Both Genders**	**Male**	**Female**	**Both Genders**	**P Value**
Facial height	109.4	101.5	105.225	8.35	8.35	8.9	<0.0001*
Facial width	120.01	112.01	116.8	9.06	9.06	8.7	<0.0001*
Facial index	91.05	90.05	90.6	9.54	9.7	9.65	>0.05

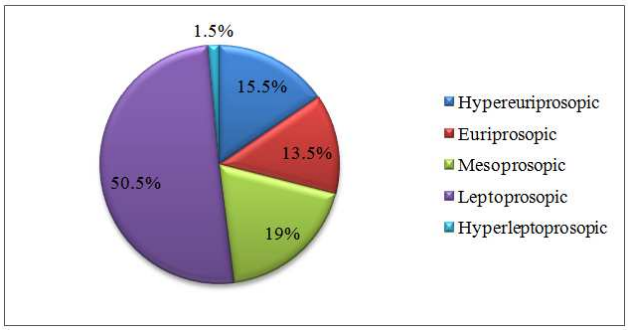

Figure 1: Facial Types in the Kurdish Population

According to the value of total facial index, the dominant type of face phenotype was leptoprosopic with a prevalence of 50.5% (43.56%males and 56.44%females), which was followed by mesoprosopic with a prevalence of 19% (55.26% males and 44.74% females), hypereuryprosopic with a prevalence of 15.5% (35.48% males and 64.52% females), euryprosopic with a prevalence of 13.5% (59.26% males and Leptoprosopic and hypereuryprosopic facial types have more incidence in females compared to males in contrast euryprosopic and mesoprosopic are more common in males than in females. Hyperleptoprosopic facial type was not seen in females but only in males (Table 3, Figure 2&3).

Table 3: Distribution of Face Type in Kurdish Males and Females

Face Shape	Male	Female	Total
Hypereuryprosopic	**11** 5.5% 35.48%	**20 10% 64.52%**	**31** 15.5% 100%
Euryprosopic	**16** 8% 59.26%	**11** 5.5% 40.74%	**27** 13.5% 100%
Mesoprosopic	**21** 10.5% 55.26%	**17** 8.5% 44.74%	**38** 19% 100%
Leptoprosopic	**44** 22% 43.56%	**57** 28.5% 56.44%	**101** 50.5% 100%
Hyperleptoprosopic	**3** 1.5% 100%	**0** 0% 0%	**3 1.**5% 100%
Total	**95 47.5%**	**105 52.5%**	**200 100%**

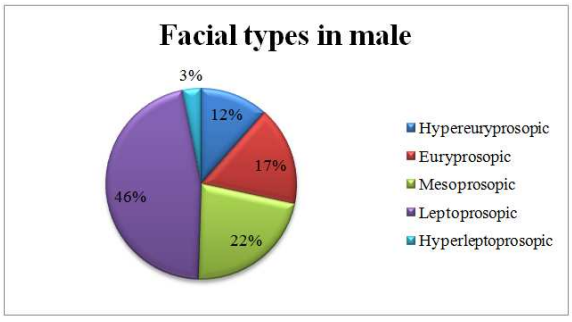

Figure 2: Facial Types in Male

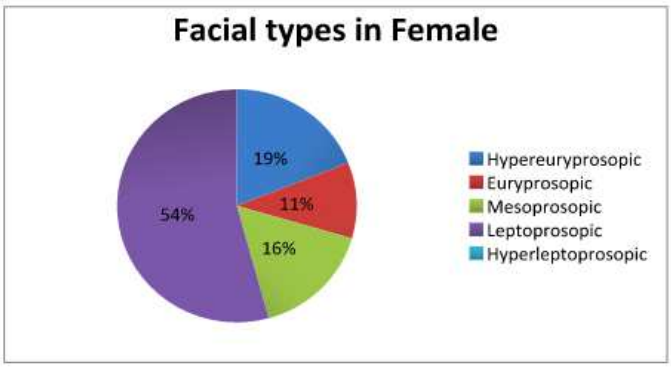

Figure 3: Facial Types in Female

DISCUSSIONS

This study showed that mean facial height for Kurdish population is105±8.9 which is lower than mean facial height of Croatian population 113.76 ±8.49 and Syrian population 109.96 ± 6.50(Đurđica Grbeša, 2007),Serbian population 116.28±7.28(D. JEREMIĆ, 2013), and Malay population 111.9±8.4 (Ngeow W C, 2009), but higher than mean facial height of Gujarati Indian population 95.26±15.04 (Twisha Shah, 2015) while the mean facial width of Kurdish population 117± 8.7 showed to be lower than the mean values of Croatian population 132.49 ±8.23 and Syrian population 132.73 ±8.81(Đurđica Grbeša, 2007), Serbian population 124.12±8.44 (D. JEREMIĆ, 2013), Malay population 127.3±8.0 (Ngeow W C, 2009) and of Gujarati Indian population 126.57±16.85 (Twisha Shah, 2015).

Regarding total facial index, the value obtained for Kurdish population is 90.6 ±9.65 which is higher than values of Croatian population 86.07 ±7.01and Syrian population 83.12 ± 6.32 (Đurđica Grbeša, 2007),,of Gujarati Indian population 75.199±6.0 (Twisha Shah, 2015), Turkish 86.2 (Sushma K. Kataria 2013) and Arabians 85.1 (Sushma K. Kataria 2013), but lower than mean facial index of Serbian population 93.68±6.86 (D. JEREMIĆ, 2013), Nigerian population 95.86 (Sushma K. Kataria 2013) and Sindhi population 92.89 (Sushma K. Kataria 2013).

This study showed that the dominant facial phenotype is Leptoprosopic followed by mesoprosopic similar to the findings of *Serbian population* (D. JEREMIĆ, 2013), but unlike *Tahamida et al* who found mesoprosopic in Malaysian population followed by leptoprosopic (Tahamida Yesmin, 2014), *Twisha et al* who found hypereuryprosopic followed by euryprosopic in Gujarati Indian population(Twisha Shah, 2015).

Regarding dominant facial type among males and females, different authors found different observations among different ethnic groups compared to findings of Kurdish population as shown in table 4

Table 4: Facial Types among Males and Females in Different Population

	Authors	Year	Ethnic Group	Total Sample	Observations	
					Male	Female
1	Ghosh and Malik (Malik, 2007)	2007	Santhals of west Bengal	800	Euryprosopic 36% Hypereuryprosopic 27.3%	Hypereuryprosopic 40.3% Euryprosopic 31.5%
2	Jahanshahi et al (Jahanshahi M, 2008)	2008	Fars	407	Mesoprosopic 44% Leptoprosopic 32%	Euryprosopic 37.7% Mesoprosopic 22.2%
3	Jahanshahi et al (Jahanshahi M, 2008)	2008	Turkman	401	Mesoprosopic 38.4% Euryprosopic 26.8%	Euryprosopic 51.7% Hypereuryprosopic 35%

Table 4: contd.,						
4	Shetti et al (Vaishali R. Shetti; Shakunthala R. Pai; Sneha, 2011)	2011	Malaysian	200	Euryprosopic 34% Mesoprosopic 24%	Mesoprosopic 34% Leptoprosopic 31%
5	Shetti et al (Vaishali R. Shetti; Shakunthala R. Pai; Sneha, 2011)	2011	Indian	200	Mesoprosopic 32% Euryprosopic 31%	Mesoprosopic & Euryprosopic 32% Leptoprosopic 12%
6	Kurnia et al(Calvin Kurnia, 2012)	2012	Chinese	48	Mesoprosopic 40% Hyperleptoprosopic & Leptoprosopic 26.67%	Leptoprosopic 42% Mesoprosopic 30.3%
7	Sapana et al (Sapana Shah, 2012)	2012	Gujarati Indian	510	Mesoprosopic 34% Leptoprosopic 27 %	Euryprosopic 32.05% Mesoprosopic 31.5%
8	Chisom et al (Chisom Eliakim-Ikechukwu, 2012)	2012	Ibo-Nigeria	300	Hypereuryprosopic 80% Euryprosopic 15.3%	Hypereuryprosopic 81.5% Euryprosopic 16.15%
9	Chisom et al (Chisom Eliakim-Ikechukwu, 2012)	2012	Yoruba-Nigeria	200	Hypereuryprosopic 66% Euryprosopic 24%	Hypereuryprosopic 79% Euryprosopic 16%
10	Kumar and Lone (Mahesh Kumar, 2013)	2013	Haryanvi Indian	600	Mesoprosopic 24.83% Euryprosopic 12%	Mesoprosopic 17.52% Hypereuryprosopic 12.5%
11	Jeremic et al (D. JEREMIĆ, 2013)	2013	Central Serbia	700	Mesoprosopic 17.78% Leptoprosopic 76.67%	Leptoprosopic 81.71% Mesoprosopic 14.29%
12	Deepu et al (Deepu Singh Kataria, 2015)	2015	North Indian	400	Mesoprosopic 47% Euryprosopic 27.5%	Mesoprosopic 44.5% Euryprosopic 31.5%
13	Present Study	2016	Kurdish	200	Leptoprosopic 46% Mesoprosopic 22%	Leptoprosopic 54% Hypereuryprosopic 19%

CONCLUSIONS

This study is important for establishing a base line data concerning facial phenotype in Kurdish population in Kurdistan region -Iraq, which could be helpful for anthropologists, forensic experts, Orthodontists, maxillo-facial surgeons, Plastic surgeons and anatomists.

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